

## CLAIMS

I claim:

1. A method of using a controller to control gas flow to a pilot burner in fluid communication with a first pilot valve and a second pilot valve, comprising:

5 using a selectable input device to open the first pilot valve to allow gas flow to the pilot burner;

lighting the pilot burner and heating one or more thermal detection devices in thermal communication with the pilot burner, wherein the one or more thermal detection devices outputs a variable voltage potential;

10 supplying the voltage potential from the one or more thermal detection devices to the controller to power the second pilot valve to allow gas flow to the pilot burner;

using the selectable input device to close the first pilot valve; and

maintaining gas flow to the pilot burner through the second pilot valve; and

15 wherein the only voltage potential used to power the controller is supplied by the one or more thermal detection devices.

2. The method of claim 1, further comprising:

cutting power to the controller when the pilot flame is extinguished; and

stopping gas flow to the pilot burner when the power to the controller is cut.

20 3. The method of claim 1, further comprising:

using the selectable input device to cut power to the controller; and

stopping gas flow to the pilot burner when the power to the controller is cut.

4. The method of claim 1, wherein the controller operates an electric servo operator pilot valve to power the second pilot valve.

5 5. The method of claim 4, further comprising:  
cutting the power to the controller when the pilot flame is extinguished; and  
when the power to the controller is cut, cutting power to the electric servo operator pilot valve to close the second pilot valve and stop gas flow to the pilot burner.

10 6. The method of claim 4, further comprising:  
using the selectable input device to cut power to the controller; and  
when the power to the controller is cut, cutting power to the electric servo operator pilot valve to close the second pilot valve and stop gas flow to the pilot burner.

15 7. The method of claim 1, wherein the selectable input device is coupled to a potentiometer that can output to the controller an indication of a position of the input device, further comprising:

using the selectable input device to select a temperature;  
opening a main valve to allow gas to flow to one or more main burners; and  
20 controlling the flow of gas through the main valve to reach and/or maintain the selected temperature.

8. The method of claim 7, wherein the main burner comprises a main burner flame, further comprising:

cutting the power to the controller when the main burner flame is extinguished;

and

stopping gas flow to the main burner when the power to the controller is cut.

9. The method of claim 7, further comprising:

using the selectable input device to cut power to the controller; and

stopping gas flow to the main burner when the power to the controller is cut.

10. The method of claim 7, wherein the controller operates an electric servo operator main valve to power the main valve.

11. The method of claim 10, wherein the main burner comprises a main burner flame, further comprising:

cutting the power to the controller when the main burner flame is extinguished;

and

when the power to the controller is cut, cutting power to the electric servo operator main valve to close the main valve and stop gas flow to the main burner.

12. The method of claim 10, further comprising:

using the selectable input device to cut power to the controller; and

when the power to the controller is cut, cutting power to the electric servo operator main valve to close the main valve and stop gas flow to the main burner.

13. The method of claim 1, further comprising activating the controller at a threshold output voltage potential.

14. The method of claim 13, wherein the threshold output voltage represents a predetermined temperature.

15. The method of claim 1, wherein supplying the voltage potential from the one or more thermal detection devices to the controller further comprises using a power converter to modify the voltage potential produced by the one or more thermal detection devices.

16. The method of claim 1, wherein the controller comprises a microprocessor.

17. A method comprising:  
using an output voltage potential from one or more thermal detection devices in thermal communication with a pilot flame of a pilot burner to supply power to a controller to power a pilot valve to allow gas flow to the pilot burner, wherein the only power used to power the controller is supplied by the one or more thermal detection devices.

18. The method of claim 17, further comprising:  
cutting the power to the controller when the pilot flame is extinguished; and  
stopping gas flow to the pilot burner when the power to the controller is cut.

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19. The method of claim 17, further comprising:  
using a selectable input device to cut power to the controller; and  
stopping gas flow to the pilot burner when the power to the controller is cut.

10 20. The method of claim 17, wherein the controller operates an electric servo  
operator pilot valve to power the pilot valve.

21. The method of claim 20, further comprising:  
cutting the power to the controller when the pilot flame is extinguished; and  
15 when the power to the controller is cut, cutting power to the electric servo  
operator pilot valve to close the pilot valve and stop gas flow to the pilot burner.

22. The method of claim 20, further comprising:  
using the selectable input device to cut power to the controller; and  
20 when the power to the controller is cut, cutting power to the electric servo  
operator pilot valve to close the pilot valve and stop gas flow to the pilot burner.

23. The method of claim 17, further comprising using the output voltage from one or more thermal detection devices in thermal communication with the pilot flame to supply power to the controller to power a main valve to allow gas flow to a main burner.

5 24. The method of claim 23, wherein the main burner comprises a main burner flame, further comprising:

cutting the power to the controller when the main burner flame is extinguished;  
and

stopping gas flow to the main burner when the power to the controller is cut.

10 25. The method of claim 23, further comprising:

using a selectable input device to cut power to the controller; and

stopping gas flow to the main burner when the power to the controller is cut.

15 26. The method of claim 23, wherein the controller operates an electric servo operator main valve to power the main valve.

27. The method of claim 26, wherein the main burner comprises a main burner flame, further comprising:

20 cutting the power to the controller when the main burner flame is extinguished;  
and

when the power to the controller is cut, cutting power to the electric servo operator main valve to close the main valve and stop gas flow to the main burner.

28. The method of claim 26, further comprising:

using the selectable input device to cut power to the controller; and

when the power to the controller is cut, cutting power to the electric servo

operator main valve to close the main valve and stop gas flow to the main burner.

29. The method of claim 17, wherein using the output voltage potential from

one or more thermal detection devices in thermal communication with the pilot flame to

supply power to the controller further comprises using a power converter to modify the

voltage potential produced by the one or more thermal detection devices.

30. The method of claim 17, wherein the controller comprises a

microprocessor.

31. A method of using a controller to control gas flow to a pilot burner in fluid

communication with a first pilot valve and a second pilot valve, comprising:

using a selectable input device to open the first pilot valve to allow gas flow to the pilot burner, the selectable input device being coupled to a potentiometer that can output to the controller an indication of a position of the selectable input device;

lighting the pilot burner and heating one or more thermal detection devices in thermal communication with the pilot burner, wherein the one or more thermal detection devices outputs a variable voltage potential;

supplying the voltage potential from the one or more thermal detection devices to the controller to power the second pilot valve to allow gas flow to the pilot burner;

using the selectable input device to close the first pilot valve;

maintaining gas flow to the pilot burner through the second pilot valve;

5 using the selectable input device to select a temperature;

opening a main valve to allow gas to flow to one or more main burners; and

controlling the flow of gas through the main valve to reach and/or maintain the selected temperature; and

wherein the only voltage potential used to power the controller is supplied by the one or more thermal detection devices.

32. An apparatus comprising:

a first pilot valve in fluid communication with a gas inlet and a pilot burner;

15 a second pilot valve in fluid communication with the gas inlet and the pilot burner;

a selectable input device that can open the first pilot valve to allow gas flow from the gas inlet through the first pilot valve to the pilot burner and that can close the first pilot valve to oppose gas flow from the gas inlet through the first pilot valve to the pilot burner;

20 one or more thermal detection devices in thermal communication with the pilot burner, the one or more thermal detection devices being able to output a variable voltage potential upon being heated; and



a controller that can receive the variable output voltage potential from the one or more thermal detection devices and that can use the variable output voltage potential to power the second pilot valve and maintain gas flow from the gas inlet through the second pilot valve to the pilot burner; and

5            wherein the only voltage potential needed to power the controller can be supplied by the one or more thermal detection devices.

33.    The apparatus of claim 31, wherein power to the controller can be cut when a pilot flame at the pilot burner is extinguished, and wherein gas flow to the pilot  
10    burner will be stopped when the power to the controller is cut.

34.    The apparatus of claim 32, further comprising an electric servo operator pilot valve that can open the second pilot valve when the controller supplies power to it and that can close the second pilot valve when the controller stops supplying power to it.

15            35.    The apparatus of claim 31, wherein the selectable input device can be used to cut power to the controller, and wherein gas flow to the pilot burner will be stopped when the power to the controller is cut.

20            36.    The apparatus of claim 34, further comprising an electric servo operator pilot valve that can open the second pilot valve when the controller supplies power to it and that can close the second pilot valve when the controller stops supplying power to it.

37. The apparatus of claim 31, further comprising a main valve in fluid communication with the gas inlet and a main burner outlet.

38. The apparatus of claim 36, further comprising a potentiometer coupled to the selectable input device, the potentiometer being able to output to the controller an indication of a position of the input device, wherein:

the selectable input device can be used to select a temperature and the controller can responsively open the main valve to allow gas to flow to one or more main burners and the controller can control the flow of gas through the main valve to reach and/or maintain the selected temperature.

39. The apparatus of claim 36, wherein power to the controller can be cut when a burner flame at the main burner is extinguished, and wherein gas flow to the main burner will be stopped when the power to the controller is cut.

40. The apparatus of claim 38, further comprising an electric servo operator main valve that can open the main valve when the controller supplies power to it and that can close the main valve when the controller stops supplying power to it.

41. The apparatus of claim 36, wherein the selectable input device can be used to cut power to the controller, and wherein gas flow to the main burner will be stopped when the power to the controller is cut.

42. The apparatus of claim 40, further comprising an electric servo operator main valve that can open the main valve when the controller supplies power to it and that can close the main valve when the controller stops supplying power to it.

5 43. The apparatus of claim 31, further comprising a power converter that can modify the voltage potential that can be produced by the one or more thermal detection devices.

10 44. The apparatus of claim 31, wherein the controller comprises a microprocessor.